



Academy Overview: Aerospace Engineering

Students choosing to enter this cluster should realize the close relationship of mathematics and science to the engineering and technology disciplines and expect to regularly apply mathematics and scientific principles throughout the courses in this cluster. They enjoy challenging curricula involving practical applications of engineering principles and technological literacy.

Knowledge gained by students in this cluster includes science and mathematics principles applicable to engineering and engineering-related careers. As technology continues its rapid expansion, adequately preparing students for engineering-related careers is essential and serves as the primary purpose of this cluster. The Science, Technology, Engineering, and Mathematics cluster classroom and laboratory provide safe and appropriate settings for student exploration and learning. The structured, yet active environment stimulates students' creativity and helps them develop the necessary skills for future employment.



Course Sequence

10th Grade	11th Grade	12th Grade
Foundations of Aerospace Engineering	Advanced Aerospace Technology 1	Aeronautics Engineering Applications or Astronautics Engineering Applications

Course Descriptions

Foundations of Aerospace Engineering

This project-based learning course engages students who are curious about aviation and aerospace careers. This course will introduce students to an engineering design process, tools to collect and analyze data, the science of aviation, materials and structures, and safety. Students will participate in real-world experiences such as designing, building and testing a pilot seat, kite, straw rocket and launcher, motor-powered rocket and a model glider.

Career and technical student organizations are integral, co-curricular components of each career and technical education course. These organizations serve as a means to enhance classroom instruction while helping students develop leadership abilities, expand workplace-readiness skills, and broaden opportunities for personal and professional growth.

Advanced Aerospace Technology

This course builds on the foundation of Course 1 and engages students in applying the design process, using tools to collect and analyze data, exploring a deeper level of the science of aviation and discovering how quality control systems work in the aviation field. Students will work collaboratively in teams to design, build and test a wing; plot a course for a plane to take off and land; design, build and test a wing attachment system; test materials under stress; and design, build and test an electric-powered plane. Students will demonstrate their newly acquired knowledge and skills by presenting their innovative ideas, techniques and solutions to business and industry partners.

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Aeronautics Engineering Applications

This project-based learning course is for students who have successfully completed Courses 1 and 2. Students will learn about systems such as flight control, remote-control vehicles and the virtual world. Students will learn to fly using flight simulators. They will work collaboratively to propose a shift from a VOR navigation system to a GPS system and determine the cost savings. In addition, students will develop rotor blades for helicopters and design and program an unmanned flying vehicle.

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Astronautics Engineering Applications

Students in this capstone course will focus on outer space and underwater applications. During the six projects, they will work collaboratively to design, build and test a laser communication system; develop a plan for space survivability in hostile environments; and utilize software to create a three-dimensional model of a satellite orbit and a team remote vehicle for underwater exploration. Depending on articulation agreements or state policy, students who successfully complete the course may be able to earn dual credit.

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